REMARKS

The enclosed is responsive to the Office Action mailed on June 13, 2008. At the time the Examiner mailed the Office Action claims 1-8 and 30-41 were pending. By way of the present response Applicant has amended claims 1, 30 and 36-38 in order to more particularly point out and distinctly claim the subject matter which Applicant regards as the invention. No claims have been canceled, and no new claims have been added. As such, claims 1-8 and 30-41are now pending. Applicant respectfully requests reconsideration of the present application and the allowance of all claims now presented.

Claim Rejections - 35 U.S.C. § 103

The Examiner has rejected claims 1-2, 4-5, 36-38 and 40 under 35 U.S.C. §103(a) as being unpatentable over *Sandhu* (U.S. Patent No. 6,084,302), hereinafter "*Sandhu*" in view of *Funkenbusch et al.* (U.S. Patent No. 5,108,597), hereinafter "*Funkenbusch.*" The Examiner has rejected claims 30-35 under 35 U.S.C. §103(a) as being unpatentable over *Noorily* (U.S. Patent No. 4,616,102), hereinafter "*Noorily*" in view of *Funkenbusch*. The Examiner has rejected claims 3, 6-7, *39*, and 41 under 35 U.S.C. §103(a) as being unpatentable over *Sandhu* in view of *Funkenbusch* as applied to claims 1-2, 4-5, and 8 above, and further in view of *Noorily*.

Claims 1-2, 4-5, 36-38 and 40

The Examiner has rejected claims 1-2, 4-5, 36-38 and 40 under 35 U.S.C. §103(a) as being unpatentable over *Sandhu* in view of *Funkenbusch*. In support of the § 103(a) rejections of claims 1-2, 4-5, 36-38 and 40, the Examiner states that "Funkenbusch et al. teaches a carbon cladding having a carbon concentration greater

than 60% by weight, see column 6, line 50 though column 7, line 2" and additionally that "It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching of Funkenbusch et al. employed in the PCB of Sandhu **in order to provide an excellent shield and a high level resistance in the PCB**." Applicant respectfully disagrees, and submits that the Examiner has not provided a sufficient teaching, suggestion, or **motivation as to why one of ordinary skill in the art would modify** *Sandhu* in view of *Funkenbusch*, and additionally has provided **no reasonable expectation of success** in the combination.

Applicant teaches and claims in independent claim 1, *inter alia*, "a first signal line supported on said dielectric board member, said first signal line including an elongated electrically conductive member that is enshrouded with a carbon-based cladding having a carbon concentration greater than 60 percent by weight."

It is Applicant's understanding that *Sandhu* discloses a method for fabricating an integrated circuit interconnect upon a semiconductor substrate to **prevent copper diffusion** into silicon based interlevel dielectric materials in order to preserve the electrical properties of the transistors. Col. 1, ll. 28-33. A copper interconnect 15 is formed over a barrier layer 12, formed of a nitride, oxide, or carbide. Col. 3, ll. 37-38. A metal is then introduced into the interconnect 15 by plasma immersion or implantation. Col. 3, ll. 45-48. An anneal step can then be performed with a carbon containing gas, where the carbon containing gas reacts with the metal implant to form a barrier layer cladding 25. Col. 4, ll. 33-67. The barrier cladding 25 functions "to prevent diffusion of copper from electrical interconnects 15 into silicon containing materials later formed adjacent electrical interconnects." Col. 5, ll. 10-13.

It is Applicant's understanding that *Funkenbusch* discloses the forming of carbon-clad oxide particles that are useful as a **chromatographic support material**. (*Funkenbusch*, col. 1, lines 5-7; col. 7, lines 6-7). Specifically, *Funkenbusch* describes a

composite support particle including a carbon cladding over the surface of a ZrO2 support particle. (*Funkenbusch*, col. 7, lines 3-6). As explained in *Funkenbusch*, the composite support particle is useful as a stationary phase in high-performance liquid chromatography. Col. 6, ll. 5-8. The composite support particles are advantageous for high-performance liquid chromatography because they exhibit "very high physical and chemical **stability in aqueous media of high pH**, e.g., pH 14. At these conditions, the particles are substantially **resistant to dissolution** of both the carbon cladding and the underlying ZrO2, and provide substantially constant solute retention during expositon to increasing amounts of alkaline mobile phase." Col. 6, ll. 22-29. The carbon cladding is deposited onto the ZrO2 support particles utilizing low pressure CVD at a temperature from about 500 °C – 1500 °C, and any carbon source which can be vaporized and will carbonize on the surface of the ZrO2 particles. Col. 11, ll. 65- Col. 14, ll. 39.

No teaching, suggestion, or motivation to combine

Obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so. *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006). M.P.E.P. § 2143.01.

Applicant respectfully disagrees with the Examiner's proposed motivation to modify the barrier cladding 25 of *Sandhu*, which functions **to prevent diffusion of copper**, by replacing it with the carbon cladding of *Funkenbusch*, which functions to provide physical and chemical **stability in aqueous media of high pH, e.g. pH 14** in high-performance liquid chromatography. The Examiner suggests that one of ordinary skill in the art would employ the carbon cladding of *Funkenbusch* in the device of *Sandhu* in order to provide an "excellent shield and a high level resistance in the PCB." Yet the Examiner has provided no explanation as to how the proposed

modification would provide "excellent shield and a high level resistance" in the device of *Sandhu*. **Is the Examiner suggesting that the carbon cladding of *Funkenbusch* would provide improved shielding and resistance to copper diffusion in the device of *Sandhu*?** If so, Applicant respectfully requests the Examiner make a submission. **Is the Examiner suggesting that the carbon cladding of *Funkenbusch* would provide improved shielding and resistance to aqueous media of high pH in the device of *Sandhu*?** If so, Applicant respectfully requests the Examiner make a submission as to why a person of ordinary skill in the art at the time of Applicant's invention would be motivated to improve the resistance of the copper interconnects of *Sandhu* (which are surrounded by silicon based dielectrics) to aqueous media of high pH (e.g. pH 14).

No reasonable expectation of success

A rationale to support a conclusion that a claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods **with no change in their respective functions**, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art. *KSR International Co. v. Teleflex Inc.*, 550 U.S. ___, ___, 82 USPQ2d 1385, 1395 (2007). M.P.E.P. § 2143.02.

Applicant respectfully submits that the Examiner has not provided a reasonable expectation of success in the proposed combination. In particular, Applicant submits that the Examiner has not provided a showing that adding the carbon cladding of *Funkenbusch* would not change the function of barrier cladding 25 in *Sandhu*, which functions to prevent copper diffusion, and that the combination would have yielded nothing more than predictable results to one of ordinary skill in the art.

For these reasons, Applicant respectfully submits that the combination cannot render obvious Applicant's invention as claimed in claims 1-2, 4-5, 36-38 and 40, and Applicant respectfully requests the withdrawal of the rejection of claims under 35 U.S.C. § 103(a) over the combination.

Claims 30-35

The Examiner has rejected claims 30-35 under 35 U.S.C. §103(a) as being unpatentable over *Noorily* in view of *Funkenbusch*. In particular the Examiner states that *Noorily* discloses "a rigid dielectric board member (20, column 3, line 12)" and that "it would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching of Funkenbusch et al. employed in the PCB of Noorily in order to provide an excellent shield and a high resistance in the PCB." Applicant respectfully disagrees, and submits that the combination does not disclose **each and every element** of the invention, that one of ordinary skill in the art would **not be motivated** to make the proposed modification, and additionally the Examiner has provided **no reasonable expectation of success** in the combination.

The combination does not disclose each and every element

Applicant claims in claims 30-35 a **rigid dielectric board** member having a plurality of conductor elements and a carbon-based cover having a carbon concentration higher than 60 percent that fully covers the top, bottom and side portions of at least one of the conductor elements.

It is Applicant's understanding that *Noorily* describes a **flexible electric cable** assembly for use with undercarpet wiring systems with electric conductors contained within a casing made from a laminate of polyester and polyvinylchloride. (*Noorily*, col. 3, lines 20-25). Specifically, *Noorily* describes "the invention of a flexible

electric cable assembly 10" having "a flexible multiconductor cable 12, an electrically insulative film 14 . . ., an electrically conductive, self-sustaining, flexible member 16 . . ., an electrically conductive, self-sustaining, flexible shield 18 . . . and a **flexible shield 20**, preferably comprising two plastic films." (*Noorily*, col. 3, lines 6-14).

Noorily expressly discloses a flexible shield 20, and therefore does not disclose or suggest a **rigid** dielectric board member. Therefore, Applicant respectfully submits that the combination of *Noorily* with *Funkenbusch* fails to disclose each and every element of the invention as claimed in claims 30-35.

No motivation to combine

In addition, Applicant respectfully submits that one skilled in the art would not be motivated to modify the flexible flat conductor electrical cable assembly of *Noorily*, in view of the chromatographic support material in *Funkenbusch*.

Noorily describes a **flexible** electrical cable assembly in which plurality of flat electrical connectors 26, 28, 30 are containing within an insulation film 32, preferably made of a laminate of polyster and polyvinylchloride. Col. 3, ll. 20-25. Conversely, *Funkenbusch* describes overcoming problems of composite support materials useful in liquid stage chromatography to provide "very high physical and chemical stability in aqueous media of high pH." (*Funkenbusch*, col. 6, ll. 5-29).

Thus, Applicant submits that an ordinary person skilled in the art of solving a problem dealing with flexible, flat conductor electrical cable assemblies would not have been motivated to modify the flexible insulating film 32 of *Noorily*, preferably made of a laminate of polyester and polyvinylchloride, to instead include a CVD carbon cladding having a high stability in aqueous media of high pH, as in *Funkenbush*.

No reasonable expectation of success

Furthermore, Applicant respectfully submits that the Examiner has not provided a **reasonable expectation of success** for implementing the CVD carbon cladding of *Funkenbusch* in the flexible electrical cable assembly of *Noorily*. Is the CVD carbon cladding of *Funkenbusch* compatible with the flexible electrical cable assembly of *Noorily*?

Therefore, Applicant requests withdrawal of the rejection of claims 30-35 under 35 U.S.C. §103(a) as being unpatentable over *Noorily* in view of *Funkenbusch*.

Claims 32 and 37

The Examiner has rejected claim 32 under 35 U.S.C. §103(a) as being unpatentable over *Noorily* in view of *Funkenbusch*. The Examiner has rejected claim 37 under 35 U.S.C. §103(a) as being unpatentable over *Sandhu* in view of *Funkenbusch*. In particular the Examiner states on page 7 of the Office Action mailed June 13, 2008 that "Funkenbusch specific[ally] shows a carbon cladding having a carbon concentration greater than 60% or approximately of 99% by weight, see column 6, line 50 through column 7, line 2." Applicant disagrees.

Applicant teaches and claims in claims 32 and 37, *inter alia*, that said carbon concentration is **at least 99% carbon by weight**.

It is Applicant's understanding that *Funkenbush* does not disclose a carbon cladding have a carbon concentration of at least 99% by weight. Applicant respectfully points the Examiner's attention to TABLES 10-1, 12-1, 13-1, and 16-1 of *Funkenbush* in which the weight percent carbon and hydrogen are measured for experiments in which CVD of carbon was deposited on various oxide spherules (Example 13), at various deposition temperatures (Example 12), for various deposition times (Example 10), and with various carbon sources (Example 16).

Arguendo, even assuming that the carbon claddings consist of only carbon and hydrogen, in no instance does *Funkenbush* demonstrate achieving a carbon cladding having a carbon concentration of at least 99% by weight.

Accordingly, Applicant respectfully requests the withdrawal of the rejection of claims 32 and 37 under 35 U.S.C. § 103(a).

Claims 6, 36 and 38

Applicant teaches and claims in presently amended claims 6, 36 and 38, *inter alia*, a signal line fully covered over/surrounded on the top, bottom, and side portions thereof with a carbon-based cladding/cover having a carbon concentration greater than 60 percent by weight.

The Examiner states that *Sandhu* discloses a signal lines enshrouded (covered or surrounded) by carbon-based claddings 25. In view of the present amendments to claims 6, 36 and 38 Applicant respectfully submits that the Examiner's rejections are now moot, and requests the withdrawal of the rejection of the claims under 35 U.S.C. § 103(a).

Claims 3, 6-7, 39 and 41

The Examiner has rejected claims 3, 6-7, 39, and 41 under 35 U.S.C. §103(a) as being unpatentable over *Sandhu* in view of *Funkenbusch* as applied to claims 1-2, 4-5, and 8 above, and further in view of *Noorily*.

In view of the above comments, Applicant submits that claims 3, 6-7, 39, and 41 are allowable for at least the reasons discussed above for independent claims 1 and 36.

Accordingly, Applicant respectfully requests withdrawal of the rejections of claims 3, 6-7, 39, and 41 under 35 U.S.C. § 103(a), over *Sandhu* in view of *Funkenbusch* as applied to claims 1-2, 4-5, and 8 above, and further in view of *Noorily*.

PETITION FOR EXTENSION OF TIME
PURSUANT TO 37 C.F.R. § 1.136 (a)

Sir:

Applicant respectfully petitions pursuant to 37 CFR 1.136(a) for a one-month extension of time to file this response to the Office Action mailed June 13, 2008. The extended period is set to expire on October 13, 2008. A check in the amount of $120.00 is enclosed to cover the fee for a one-month extension of time.

Pursuant to 37 C.F.R. § 1.136(a)(3), applicant(s) hereby request and authorize the U.S. Patent and Trademark Office to (1) treat any concurrent or future reply that requires a petition for extension of time as incorporating a petition for extension of time for the appropriate length of time and (2) charge all required fees, including extension of time fees and fees under 37 C.F.R. §§ 1.16 and 1.17, to Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN

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